Largest Electricity provider in the **US**

We have **partnered with the largest electricity** provider in the **US** to build centralized operations and maintenance for **power generation plants**.

The Company is the largest energy provider in the United States as measured by retail electricity produced and sold, serving more than five million customer accounts or an estimated 10 million+ people across the state. It operates one of the cleanest power generation fleets in the U.S.A.

Existing Challenges

The customer operates various fossil fuel power generation plants, critical assets being gas turbines, generators, HRSG (Heat Recovery Steam Generator), and BoP (Balance of Plant).

The O&M (Operations & Maintenance) teams were managed at an individual plant level. The customer wanted to increase power reliability and reduce operational costs by centralizing O&M teams and Board operators.

Objectives of the Project

01 Reduce operation and maintenance costs by **15%**

02 Increase power reliability across the client's 11 fossil fuel power generation plants and critical assets — gas turbines, generators, steam turbines, etc.

03 Centralization of operations & maintenance processes.

04 Support fleet monitoring, centralized operations, and maintenance using a cloud platform.

Happiest Minds Scope

• Define the overall solution architecture across key pillars of the Reimagine program: centralizing management and control of plant operations and removing manual effort involved in O&M processes through a digital transformation to the greatest extent possible.

• Assess gaps required for seamless functioning of the centralized O&M and command center.

• Define and develop solutions with technology interventions required for addressing identified gaps.

• Prioritize the solutions for execution.

• Design a high-level solution blueprint for shortlisted solutions.

• Provide deep-dive details on daily and outage work processes.

• Leverage AI/ML models for optimizing work orders and improve data quality for validation, prioritization, and scheduling of daily and outage work.

The Journey

The plant's operations and maintenance process were carried out locally, and there was a massive gap in the data and the process. The customer wanted to increase the reliability of power and reduce operational costs. And it was to be done by identifying critical assets, prioritizing work schedules, and identifying gaps in the asset and work management.

The customer aimed to digitize the documents, be it procedure, mechanical & engineering diagrams, or manufacturer documents and tag them to the

corresponding assets. Additionally, there was a need for real-time anomaly identification in sensor data. Happiest Minds took cognizance of their problems and challenges and guided them on a digital transformation journey to reimagine their current state.

Digital transformation initiatives may have their own specific goals, but the primary purpose of any digital transformation is to improve your current processes. **At Happiest Minds, we have our own methodical 4E mindful digital transformation framework wherein the 4Es stands for Explore, Envision, Engineer, and Enhance.**

As per our approach in the **Explore** stage, we did the **digital maturity assessment** by studying the gaps between the current state and targeted state maturity. We assessed through the function of maintenance management and enterprise asset diagnosis as it helped identify critical assets and take further initiatives in the asset and work management. One of our customer's objectives was to centralize the processes and reduce operational and maintenance costs.

01

In the **Envision** stage, we defined the problem statement and strategized on achieving the future envisioned state. The customer had 11 plants, with 26 to 30 maintenance staff per plant. The O&M work orders were manually intensive and couldn't be managed at an individual plant level. To reduce this intensive work and cut down O&M costs, we used AWS IoT cloud to design a solution supporting fleet monitoring and centralizing operations and maintenance activities. Along with it, critical asset identification was prioritized for the work order schedules and to minimize the maintenance cost. Digitization of documents was also given priority to reduce the turnaround time.

02

The **Engineering** stage was where the transition happened from the current state to the target state by defining the overall solution architecture across key pillars of the Reimagine program. We assessed the gaps required for the seamless functioning of their Operations & Maintenance teams. A high-level solution blueprint was created. AI/ML models were used to optimize work orders and improve data quality for validation, prioritization, and scheduling of daily and outage work.

03

04

Enhance stage is a continuous stage that will help the customer to evolve these solutions towards the reimagined state.

Some of the key business impacts we brought to our customer during these stages, and the digital capital we delivered were:

01 Reduction of efforts per day per engineer led to overall O&M savings.

02 AI/ML models for validation, prioritization, and scheduling of work orders for daily and outage work.

03 Digital twin creation with the digitization of P&ID by establishing asset relation with material flow.

04 Created a digital transformation roadmap by conducting plant visits and interviewing 30+ stakeholders.

05 low reduction in the number of low watch operators across plants through increased automation or enabler of reductions.

06 Effective remote management and maintenence of all the 11 fossil fuel power generation plants from a centralized solution.

Few of the other digital ventures that we are working on with our customer

PDF/ Word Parser
Page extraction

Image Processing
Image quality check
Page classification
Template Classification

ROI Extractor
Region detection classification
Image Vs blueprint Vs text Vs table

Component Classification
Deep learning to detect components or symbols
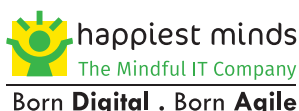
OCR
Extract Component's make and model number

Component Classification
Associate components maintenence dependency and map

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